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### **Diurnal Emissions from In-Use Vehicles**

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#### **ABSTRACT:**

One hundred fifty-one vehicles were recruited from the I/M lane in Mesa, AZ during the summer of 1996, and their 24 hour diurnal emissions were measured in a variable temperature SHED (VT-SHED). The fleet selection included the earliest applications of evaporative emission control, and later technologies that had at least 5 years of exposure. Model years 1971 through 1991 were tested.

Fifty-three percent of the sample tested had daily emissions of more than 10 grams. Five of the 151 were over 50 grams per day, and had significant liquid leaks. Twenty-six (17%) of the vehicles had emissions exceeding one gram per hour. Thirty-two of the 151 tested (21%) had identifiable liquid leaks. Carburetor systems had higher emissions than fuel injection systems. The highest emitters had resting losses of more than 0.8 g/hr. These eight highest emitters were considered outliers for the purposes of general analysis, and were not used, as is noted in the report.

"Resting Losses" were estimated for the fleet using the last 6 hours of the diurnal. Carbureted vehicles averaged 0.2 g/hr (outliers omitted) and fuel injected vehicles were estimated at 0.1 g/hr.

Analysis of the closed bottom canisters against the open bottom design indicated a 2 gram per day difference between the two designs. An I/M purge and pressure check identified most of the major failures, but often for the wrong reasons.